

### **REMARKS**

Currently, claims 28, 30-31, 33-47, 49-50, and 52-61, including independent claims 28 and 47, are pending in the present application. Independent claim 28, for instance, is directed to a method of utilizing a triggerably releasable delivery system in the treatment of a patient. The method comprises administering to a patient a plurality of nanoparticles containing silica coated with alumina and having a size of about 500 nanometers or less. The alumina provides a site on a surface of the nanoparticles to which is bonded a functional compound. The nanoparticles also possess a positive surface charge, i.e., a zeta potential of about 20 millivolts or more. The functional compound is released from the surface of the nanoparticles upon exposure to an environmental or chemical condition.

In the Office Action, previous dependent claims 29 and 48 (now incorporated into independent claims 28 and 47, respectively) were rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,007,795 to Masterman, et al. in view of U.S. Patent No. 4,451,388 to Payne. Masterman, et al. is directed to a method for inhibiting bacteria in the mouth of a patient. The method includes placing a particle containing a degradable material (e.g., poly(DL-lactide)-co-glycolide) and an anti-microbial agent into the mouth of a patient. The anti-microbial agent may be dispersed throughout the particle along with the degradable material, enclosed within a skin composed of the material, or attached to a skin composed of the degradable material. (Col. 4, ll. 64-67). Suffice to say, the anti-microbial agent is specifically associated with the degradable material so that it is released only upon its degradation. The particle may also be coated with a water-stable material (e.g., polystyrene) that does not degrade when

exposed to saliva. The coating is instead disrupted by brushing, flossing, or chewing, which then exposed the degradable material to saliva and causes the anti-microbial to be released.

Masterman, et al. cursorily mentions that the degradable material can also be included in an organic/inorganic composite that includes a degradable polymer mixed or covalently bound to a mineral. It is on this basis that the Office Action asserts that Masterman, et al. discloses the limitations of independent claim 28. Even if the organic/inorganic composite of Masterman, et al. were somehow akin to the claimed nanoparticles, however, Applicants respectfully point out that independent claim 28 expressly requires that the alumina provides a site on the "surface" of the nanoparticles to which is bonded the functional compound. This is not the case with Masterman, et al. In fact, if the anti-microbial agent of Masterman, et al. were bonded to a surface of the particle as in the present claims, it would be immediately exposed and released to the mouth of a patient, thereby completely vitiating the purpose of the "degradable material" to controllably release the agent only upon disruption of the water-stable coating and subsequent contact of the degradable material with saliva.

In addition to those noted above, Masterman, et al. also fails to disclose other limitations of independent claim 28. For example, the claimed nanoparticles possess a zeta potential of about 20 millivolts or more. As described in the present specification, the manner in which the functional compound is bonded to the alumina allows the particle to retain a positive surface charge (measured as zeta potential), which in turn allows it to be affixed to various substrates without requiring the use of chemical binders or other attachment structures. The Office Action indicates that such a zeta potential is

inherent in Masterman, et al. because the composite particles are made of the "same material (tetracycline adsorbed or chemically bound to alumina)." However, the composite particles of Masterman, et al. are not made of tetracycline bound to alumina, but instead of a degradable material (e.g., poly(DL-lactide)-co-glycolide), mineral, anti-microbial agent, and water-stable coating (e.g., polystyrene). There is simply no indication that such a composite would "necessarily" possess the claimed zeta potential as is required to establish a prima facie case of inherency. Thus, for at least the reasons indicated, Applicants respectfully submit that independent claim 28 patentably defines over Masterman, et al.<sup>1</sup>

Applicants respectfully submit that the present application is in complete condition for allowance and favorable action, therefore, is respectfully requested. Examiner Schlientz is invited and encouraged to telephone the undersigned, however, should any issues remain after consideration of this Amendment.

Please charge any additional fees required by this Amendment to Deposit Account No. 04-1403.

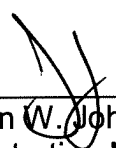
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<sup>1</sup> Payne was cited in combination with Masterman, et al. for the teaching of silica coated with alumina. Payne does not, however, cure any of the defects of Masterman, et al. mentioned above.

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Respectfully requested,

DORITY & MANNING, P.A.



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Jason W. Johnston  
Registration No. 45,675  
P.O. Box 1449  
Greenville, SC 29602-1449  
Phone: (864) 271-1592  
Facsimile: (864) 233-7342

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